Agricultural and the Border – Unique Opportunities

Sandia National Laboratories

Darryl D. Drayer

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Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy under contract DE-AC04-94AL85000.

Sandia National Laboratories

An Issue of International Importance:

Farm to Fork…

Every person in North America depends on SAFE Agricultural Production, Processing, and Distribution for Life and Health.

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Billions of dollars are lost and people die when farm-to-fork systems fail.

These systems affect public health

Mad Cow (BSE) in UK

E. coli and salmonella deaths in the U.S.

They affect the national economy

ALAR scare in the U.S.

Foot-and-mouth disease in UK

Why should a DOE National Security Laboratory work on these problems?

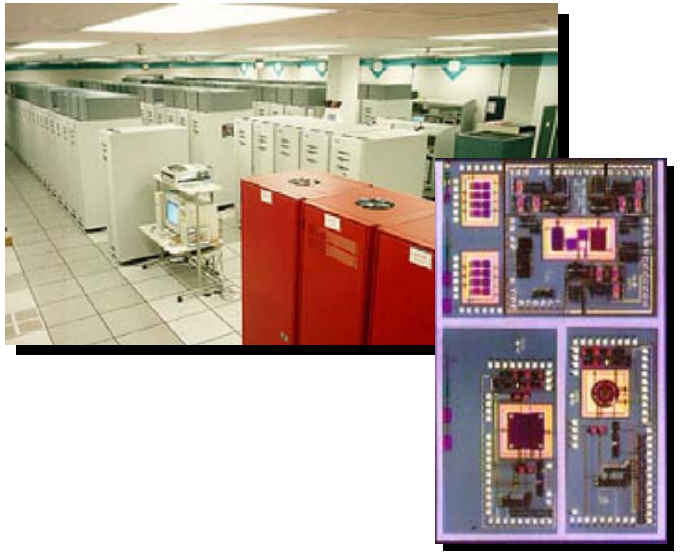
Agricultural Security and Food Safety Initiative

Solutions are needed for complex technical problems

Sandia Labs creates high-tech, interdisciplinary technologies

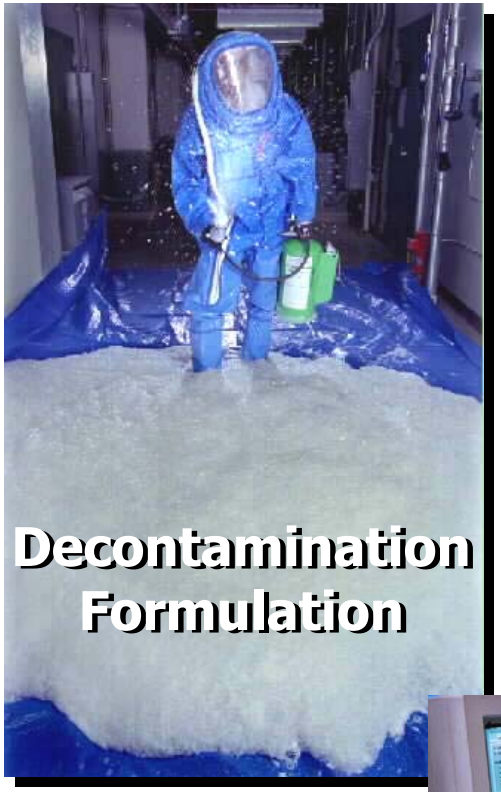
- ***Production line decontamination***
- ***Herbicide/pesticide/antibiotic contamination and carry over***
- ***Disease Surveillance and Control***
- ***Economic competitiveness***
- ***Water quality and usage***
- ***Safety of imported foods***

- ***High-Performance Computing***
- ***Modeling***
- ***Microsensors***
- ***Risk Analysis***
- ***Physical protection***



Some Projects are Under Way

Agricultural Security and Food Safety Initiative



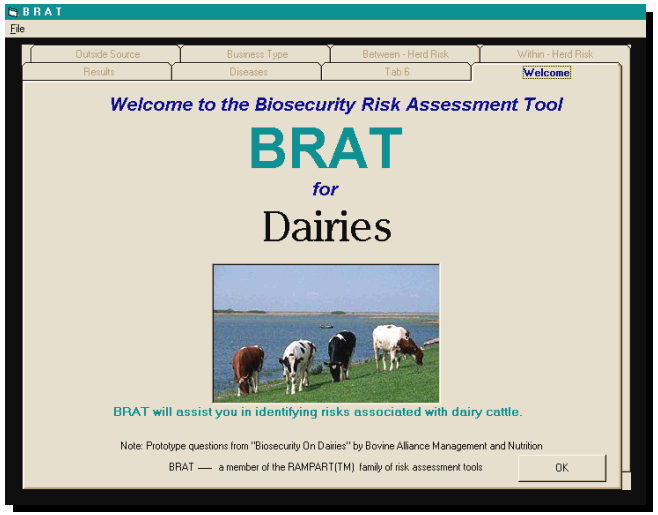
Agricultural Security and Food Safety Initiative: Tomorrow's Technology for Today's Agriculture

Rapid Syndrome Validation Project

Water Security and Sustainability

Other Projects Are Under Development

Agricultural Security and Food Safety Initiative



Bio-Risk Assessment Tools

RSVP-A: Prediction of outbreak and spread of animal disease

Farm-to-Fork Traceability

Carcass Disposal

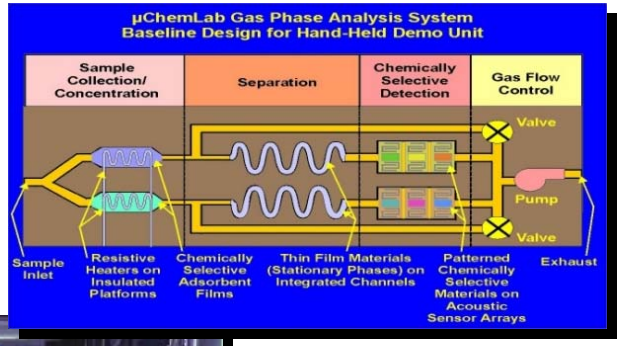
Some agricultural issues are unique to the border region:

- ***Commerce across the border***
- ***Economic development***

Commerce Related Issues

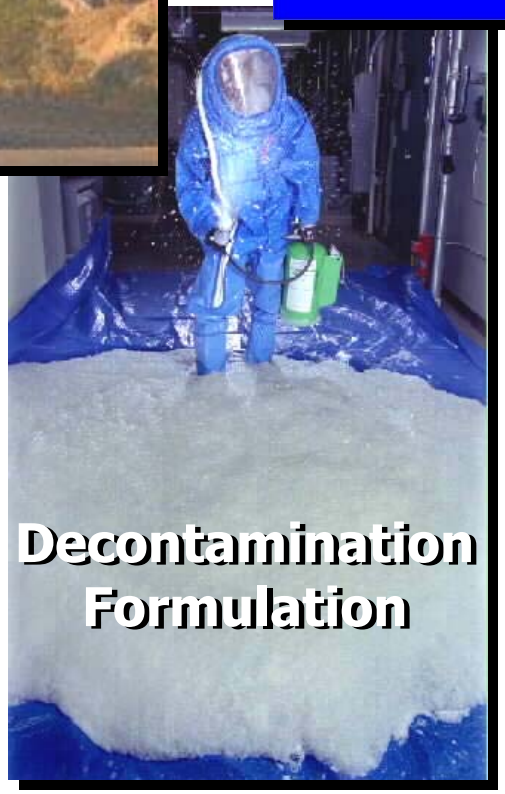
Ease the flow of products

Farm-to-Fork Traceability



Pathogen detection

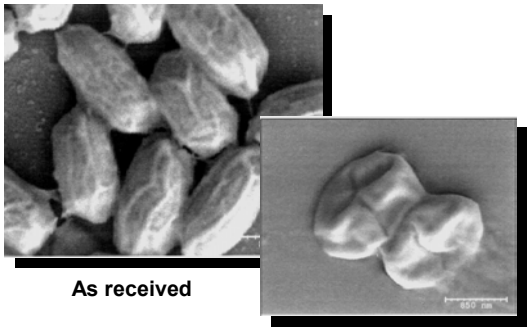
RSVP-A: Prediction of outbreak and spread of animal disease



Sandia Decontamination Formulation

Sandia has developed a non-toxic and non-corrosive <u>aqueous foam</u> for the rapid destruction of bacterial spores, vegetative cells and viral agents

Destruction of bacterial spores in Sandia foam >>

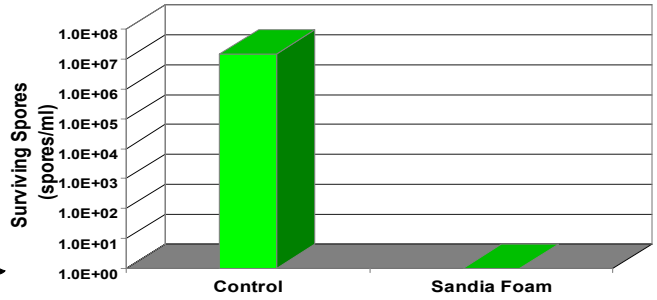


As received

Sandia Foam
Contact Time: 1 Hour

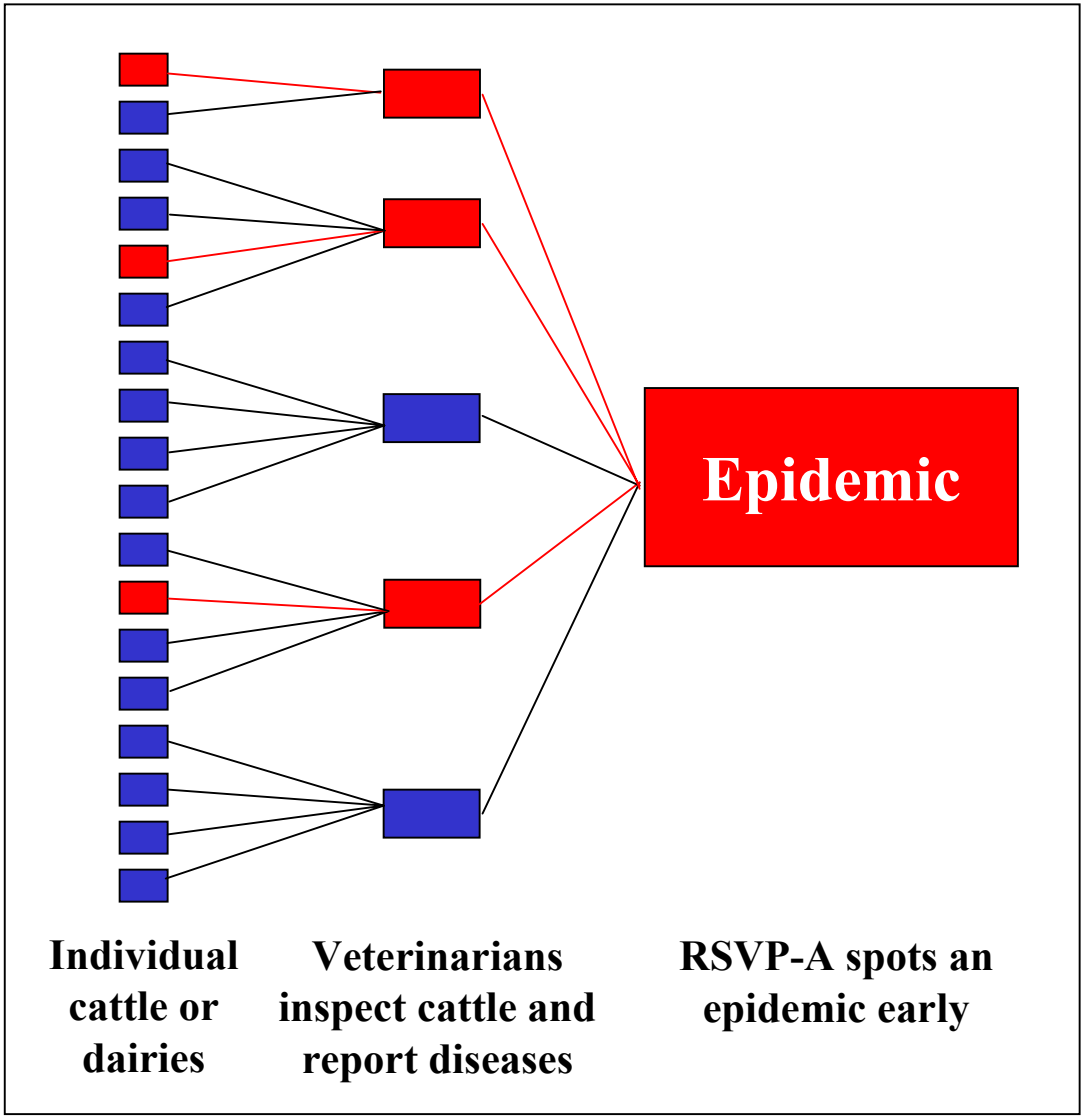
<< Decon Formulation can be deployed as a foam, liquid spray, or fog

Bacterial Spore Kill >>



Rapid Syndrome Validation Project for Animals (RSVP-A)

RSVP was designed to spot epidemics in humans. RSVP-A will do the same for domesticated animals



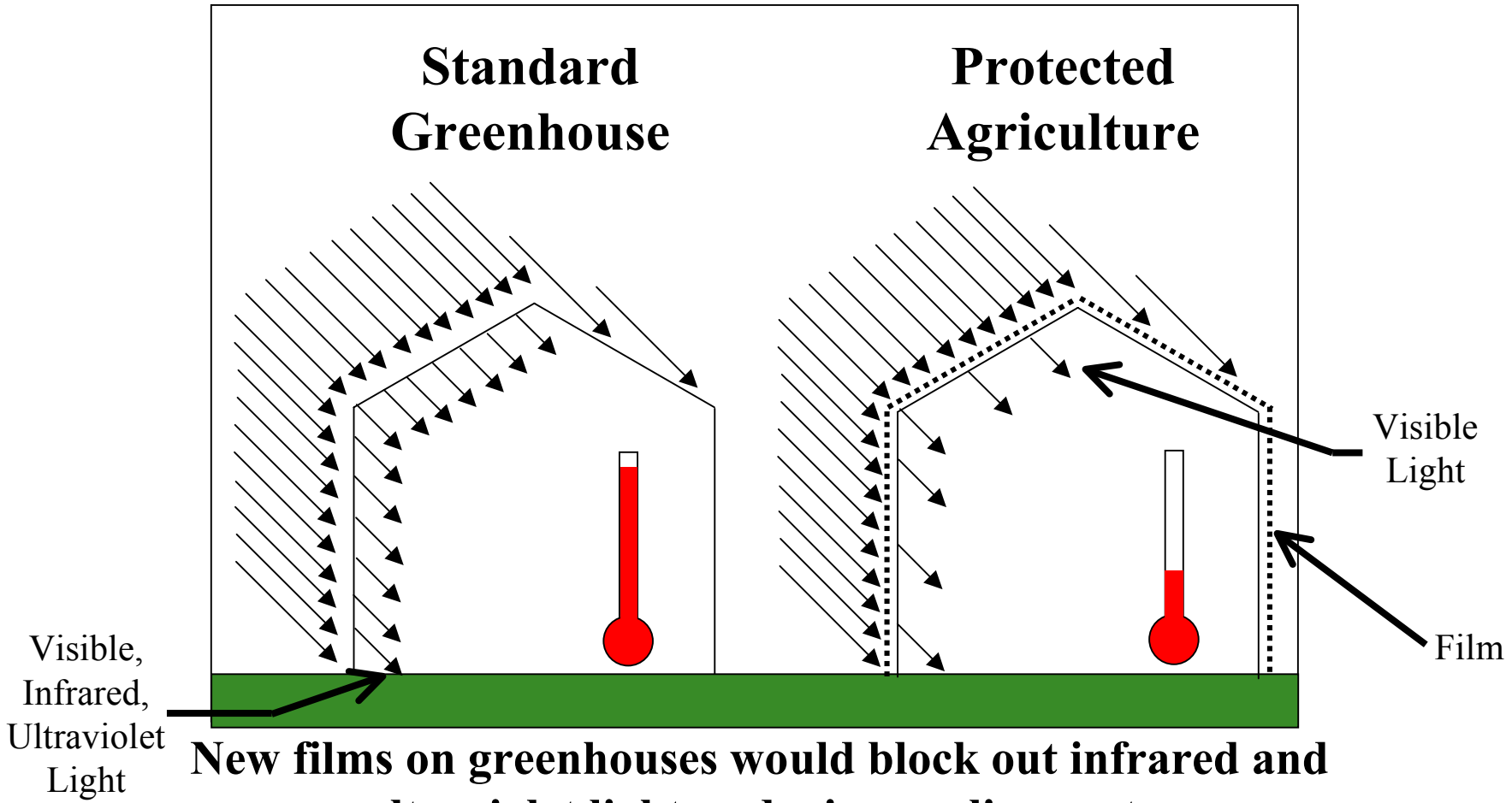
Economic Development

Protected Agriculture

Evaporation Suppression

Economic Development

Protected Agriculture

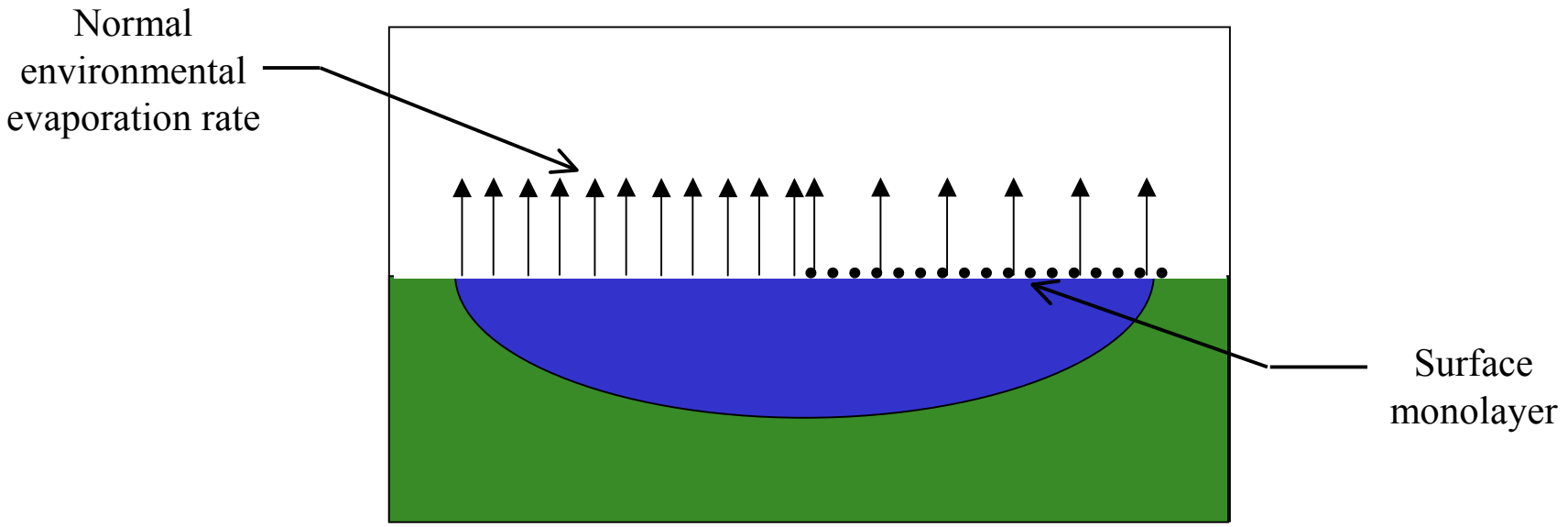


New films on greenhouses would block out infrared and ultraviolet light, reducing cooling costs

Research Question: How does the film affect water usage? Insect activity? Nutrient demands

Economic Development

Evaporation Suppression



Applying a surface film (monolayer) onto a body of water to prevent or slow evaporation

Research Questions: How does water and wave motion affect the monolayer?
How does the monolayer affect the environment of the body of water?

Status Highlights

- **SNL/KSU/NMSU MOU**
- **RSVP-A $60WFO**
- **Pathway Analysis $200K WFO**
- **Bioseucrity Curriculum Development**
- **FMD WG Participation**
- **Carcass Disposal Steering Committee**
- **BRAT Demo and Report**

Status Highlights

- **Continued Research on Decon Foam**
- **Joint Proposal with NMSU on Monolayers & Aquatic Systems**
- **FDA Funding on Decon for CWD**
- **Protected Ag. Proposal**
- **Border workshops San Diego & Chihuahua**

Conclusion

- Sandia would like to team with Mexico on development and demonstration of protected agriculture
  - Mexico – greenhouse, growing, monitoring
  - Sandia – films for the green houses, analysis
- Sandia is also interested in discussing joint opportunities in other agricultural areas

Tomorrow's Technology of Today's Agriculture